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Fulling Around: The Shaker Fulling Mill at South Union, Kentucky

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by

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The fulling mill was an essential component of any successful early-19th century woolen industry. Fullers applied finishing techniques to cloth in order to create a stronger, more attractive, and more useful fabric. In 1813 the Shakers at Kentucky's South Union community constructed a fulling mill that serviced their own demands for textile finishing processes as well as those of area residents. The fulling mill, aided by the Shakers' three-year-old carding mill, developed by the 1860s into a full-fledged woolen factory, an evolutionary pattern familiar to most woolen processors.[1] Extant documents reveal a great deal about the fulling mill's development and daily activities. Information gleaned from these records can assist textile historians and historic interpreters who are interested in period clothing construction, available dye colors, prevalent fabrics, and contemporary textile processes in the first quarter of the 19th century.[2]

The Shakers, or the United Society of Believers in Christ's Second Appearing, have resided in the United States since Ann Lee, an English textile factory worker, and eight followers immigrated to America in 1774. The sect reached its peak membership in the 1840s, with approximately 6,000 members in 18 different communities. These villages, chiefly in pastoral settings, were located as far north as Sabbathday Lake, Maine (where the only remaining Shakers reside), as far south as Florida, and as far west as South Union, Kentucky, 12 miles southwest of Bowling Green. The South Union village was established in 1807, the indirect result of the revival fervor that swept through Kentucky during what has subsequently been termed "The Second Great Awakening." Although separated by hundreds of miles, the Shaker communities retained a high degree of consistency in their doctrine. The sect held several principles supreme: celibacy, gender equality, communal living separated from "the World," and a strict obedience to a hierarchical authority.[3]

TEXTILE PRODUCTION AND THE SHAKERS

Much of the renown bestowed on Shaker material culture rests with their furniture, but other Shaker-produced items, such as textiles, merit further exploration. The South Union community produced linen, woolens, and silk in a manner similar to their contemporaries, only on a more

monumental scale. Consumers valued Shaker textiles for their quality of workmanship, subtle use of color, and superior but simple construction.

The Shakers always attempted self-sufficiency; when establishing a new community they considered the construction of mills a primary task. Shortly after the Shakers founded the South Union community, they built two mills – one to tan leather and another to saw lumber. In August 1813, the Shakers commenced digging the foundation for a grist mill which housed the fulling mill in its east end; fulling and grist mills were commonly located in the same building because both made use of water power. Ten months later workers started framing up the building on its completed foundation. In late 1814, prior to the fulling mill's completion, three Shaker brethren, with "two large teams & wagons," made a round-trip journey of 21 days to the "Iron Works" in order to purchase fuller's plates and a large stove to heat them, dye kettles and other needed equipment for which they paid $186.85.[4]

The mill, constructed of stone and 150,000 bricks, began operation on 6 January 1815. The community's journalist recorded: "The Fulling Mill starts, have on hand from country and ours about 3,200 yards to dress." Within three and a half months he noted: "Fulling mill – about 5,000 yards received to date & 1,800 yards dressed off." The mill's rhythmic cadence could be heard from a distance and the journal noted with pleasure "fulling mill pounding."[5]

To promote their textile finishing business, the South Union Shakers circulated a broadside in 1815 advertising the continuation of their fulling mill operation (Figure 1). The Shakers having outgrown an earlier enterprise, decided to further mechanize and expand their capabilities. Shakers accepted cloth at the mill site, but depended heavily on merchants from as far away as 50 miles to gather cloth at their stores. The broadside instructed customers that when "sending your cloth to the clothiers…roll it up tight; put a safe bag or wrapper round it…. Particular directions, in writing must attend every piece of cloth, and what is wished to be done to it." The Shakers assured their customers that they could "rely on the utmost punctuality, neatness and dispatch in our power," but the community noted in print that they did no business "on the first day of the week [Sunday]."

The Shakers also distributed "INSTRUCTIONS for the information and benefit of Domestic Manufacturers of Woolen Cloths" which advised customers on precise methods of washing sheep before shearing, cleaning the fleece of trash, sorting the coarse from the fine wool, mixing the wool, spinning, scouring grease from the wool, and weaving. Attention paid to the careful manufacture of woolen cloth prior to finishing resulted in a better end product. The Shakers noted that "having followed the foregoing directions, and the clothiers do their duty, you [the customer] will be pleased with your own work and theirs too."[6]

RECORD BOOK ANALYSIS

The Shakers kept fastidious records related to the fabric they received from the World for processing.[7] From six fulling mill record books, dating from 1814 to 1822, the authors have extrapolated information for a database, which allowed for data synthesis. Figure 2 is a typical sheet from the fulling mill record books. The Shakers' neat records made delineating the data elements an easy task. Although record book keepers varied, the data elements generally remained constant. Some recorders made more detailed entries than others, and of course some possessed better penmanship.

Problems did occur when the record keeper did not make complete entries. For example, occasionally the keeper did not record the yardage of fabric, but would indicate that it was to be used for making a great coat. The authors estimated the average amount of cloth needed to construct a great coat and then recorded that yardage in the appropriate column. Figure 3 displays the data elements chosen for the database. Because of the possibility of variance in any given element and due to the sophistication of current technology and software, we added another tier of information gathering for elements such as color. For example, if something was to be dyed "dark bottle green" it was considered first as green, but was also recorded at a second level as "green, bottle dark."

The six record books contain a total of 2,027 transactions. By modern standards this might be considered a minuscule operation, but in the early-19th century and in an extremely rural area this

number represents a significant industry. The transactions represent a total of 35,161 yards, or nearly 20 miles, of fabric. The average order consisted of approximately 17.33 yards. Although a considerable amount of cloth, this 35,161 yards does not represent the mill's total work. Fabric processed for the South Union community, which would have been considerable, is not included. Such records may have been kept, but none have survived.[8]

THE FULLING PROCESS

At the fulling mill, the Shakers performed a number of finishing processes on fabric ranging from fulling to pressing. (See Table I for the textile finishing processes available at South Union.) Fabric

TABLE I

PROCESS	YARDAGE
Full	31,748.75
Dye	32,198.00
Scour	1,350.50
Dress	14,259.75
Shear	12,029.75
Press	1,951.25

was first fulled using moisture, heat, and frictions to clean, shrink, and felt the cloth. Workers placed woolens in a tub of water where beaters, lifted by the water wheel, alternately pounded the cloth causing it to tumble over and over. The hot water and agitation caused the material to shrink and the textile's fibers to interlock forming a stronger, firmer product than the loosely woven fabric cut from the loom. Fullers used soap, urine, fuller's earth, and other alkaline substances to cleanse, or scour, the natural grease from the wool.[9] Figure 4 exhibits a typical fulling mill configuration.

Fulling is a finishing process for woolens. Although some other fabrics benefit from fulling, woolens require the process in order to produce a usable cloth. Unfortunately, the Shakers classified only 7,693 yards, or 25 percent of the total yardage treated at the South Union fulling mill, by cloth type. Of this yardage, the record keepers called 463.5 yards simply "cloth." Since fulling is chiefly reserved

for woolens, most of the remaining 23,000 yards of fabric were undoubtedly woolens of some type. Table II represents the type of fabric – by content, by name, or by weave structure – mentioned. Linsey, a mix of wool and flax fibers, represents the largest category, accounting for 95 percent of the named fabrics on the list. The other woolens mentioned include satinett, flannel, casinett, and woolen Janes (jeans).[10]

TABLE II

FABRICS

FABRIC	YARDAGE
Casinett	22.75
Flannel	101.00
Linsey	6,983.75
Mixt/Mixt Cloth	78.75
Satinett	40.75
Twill/Twilled Cloth	73.75
Woolen Janes	16.50
Unspecified	27,844.00
Total Yardage	35,161.25

After fulling, the cloth's uneven fibers were napped to improve the material's softness and appearance and to prepare it for shearing. Textile workers raised the nap with the prickly flower head of the Dipsacus fullonum, a plant commonly known as the fuller's thistle. The barbed teasel was brushed over the fabric forcing the fibers to stand up.[11] By 1830, most American manufacturers employed a napping machine or teasel gig to perform this task. These machines utilized either natural teasels or wire cards to brush the cloth.[12]

Workers then cropped or sheared the napped fabric to give the cloth a more pleasing appearance and a better hand (feel). Fine fabrics were sheared several times. Traditionally, skilled shearsmen wielded forty-pound shears to cut the fabric's raised nap. By the early-19th century, automated shearing machines, which required little skill to operate, were being developed in America.[13] The South Union

Shakers obtained automated shearing machines from other Shaker communities. Union Village, Ohio (1814), Pleasant Hill, Kentucky (1816), and Watervliet, Ohio (1849).[14]

DYEING THE CLOTH

Dyeing, one of the last steps before stretching and drying the cloth, was also performed at the fulling mill. Cloth could be dyed prior to processing or colored after napping and shearing. One contemporary authority recommended the fabric be sheared twice, colored, and sheared again.[15] More cloth was dyed at the fulling mill than was fulled, which indicates that some customers sent already fulled cloth to the mill for dyeing only. Like many professional dyesters, the Shakers purchased dyestuffs from area merchants. Initially the Shakers purchased the bulk of their dyestuffs in Nashville, Tennessee. This arrangement shifted in the 1840s when a Bowling Green, Kentucky, merchant, J.I. Younglove, began to carry the needed chemicals and mordants. South Union Shakers made some of their dyes from natural and readily available materials, but they also purchased: indigo, logwood, madder, verdigrisse [verdigris], oil of vitriol, "peruvian" barks, redwood, camwood, fustick, red tarter, blue vitriol, chrome yellow, "venetian" red, alum, and copperass.

TABLE III

COLORS

COLOR	YARDAGE
Drab	15,869.50
Black	8,222.25
Green	3,088.50
Brown	2,802.25
Blue	1,865.75

Others: snuff, lead, dove, flesh, gray, orange, red, smoke, slate, yellow, mouse

Discovering the most prevalent colors asked for by the Shakers' customers provides useful information for textile historians and for period interpreters. Table III indicates the colors most requested at the Shaker mill, with drab being the most popular.[16] Prices for dyeing varied greatly according to the color requested; this was due in large part to the varying prices of dyestuffs needed for a particular color. Fulling mill customers requested a wide palette of shades for each major color, leaving the dyester the tricky task of interpreting their specifications. Table IV lists the variants of brown that customers requested. On occasion a customer sent a swatch of fabric for the dyester to match.[17]

TABLE IV

NAMES FOR BROWN

Brown	Clear Light Brown	Olive Brown
Best Brown	Clear London Brown	Spanish Brown
Medium Brown	Coffee Brown	Walnut Brown
Chestnut Brown	Good Brown	Deep Brown
Cinnamon Brown	Dark Chestnut Brown	Genuine London Brown
	Dark London Brown	

To give the cloth a smooth, lustrous surface, the fuller pressed the fabric using pressure and heat. A common pressing device was the screw press which applied even pressure to carefully folded cloth sandwiched between two wooded plates. With special paper and hot metal plates inserted into the layers of cloth, two large upright screws compressed the bundle.[18]

The Shakers accepted cloth at the fulling mill or from satellite locations such as the five merchants listed in the 1815 fulling mill broadside.[19] In the fulling mill's account books, the record keeper listed the name of the original sender with his city or county of residence. We recorded 54 different originating locations. (Table V lists the top ten counties of origin.) It is not surprising that most of the cloth was brought from customers within the radius of 50 miles, but some cloth was brought from as far away as 135 miles. Unfortunately the number three position is occupied by "Unidentified

locations" (See Table V). The top ten originating locations account for 87 percent of the work brought to the mill. It is difficult, if not impossible, to determine if fulling mills were available in these areas, for

TABLE V

TOP TEN ORIGINATING COUNTIES

COUNTY	YARDAGE
Logan	9,090.25
Warren	7,299.50
Unidentified	5,737.75
Christian	1,666.75
Muhlenberg	1,447.75
Butler	1,404.50
Sumner, Tenn.	1,290.00
Barren	1,063.50
Robertson, Tenn.	996.25
Simpson	815.25
Allen	668.00

many continually flowing streams and rivers which could have supported such operations are located in the region. For many it was easier and safer to deliver a piece of cloth to the nearby general store for transport to the Shaker village than to deal with an unskilled fuller at a small mill located in the same county. Figure 5 indicates the Kentucky and Tennessee counties that sent at least one parcel of cloth to South Union.

CUSTOMER SATISFACTION

It is difficult to judge the degree of customer satisfaction with the Shakers' fulling mill operation. Return patronage may be the only way to determine if users were pleased with the services rendered at the mill. Many customers used the Shaker fulling mill services on several occasions, including Jacob S. Baker of Muhlenberg County. In 1816 he sent 23.5 yards of wool fabric to the Shakers to be fulled, sheared and dressed in the neatest manner and dyed black.[20] He indicated that the fabric was for "women's dress." Two years later he sent 21.25 yards of wool fabric to the mill to be fulled only and

indicated it was to be used for blankets. The next year he had 13.5 yards of wool fabric fulled thick, because it was for a great coat. This transaction also indicates that Baker commissioned the Shakers to weave the fabric at their Frame House.[21] Surely he liked the finished project, for he recommended the Shakers in 1820 to his brother David, also of Muhlenberg County, who had 12 yards of fabric woven at the North Brick House for a great coat. Another apparently satisfied customer was William Loving of Logan County. He had 22.25 yards of linsey janes fulled and dyed black at the mill in 1817. The next year he had 39 yards of woolen cloth woven at their Frame House and dyed light drab. Two years later he sent 29.25 yards of wool cloth to be fulled and dyed navy blue.[22] Many other satisfied customers patronized the Shaker mill on several occasions during this ten year period, and undoubtedly they recommended the service to their neighbors.

A fabric's ultimate use determined the types of finishing processes it would undergo. Fabric for a heavy great coat would generally not be sheared to neatest manner, since it was not worn close to the skin and the extra density helped keep the wearer warm. Of the fulling mill transactions 1,120 or 55 percent indicate the fabric's intended use; these transactions represent 20,467.25 yards of fabric or 59 percent of the total yards finished at the mill. The four most frequently noted uses of the fabric were: "great coats" (654 transactions or 11,780.25 yards); "close clothes" (218 transactions or 4,308.5 yards); "women's dress" (177 transactions or 3,163.25 yards); and "blankets" (38 transactions or 706.75 yards). Other interesting uses include pantaloons, surtouts, and "negro's wear."[23]

THE DEMISE OF THE MILL

Available documentation indicates that South Union operated a fulling mill until the 1860s. The woolen industry at South Union, of which the fulling mill was an essential component, paralleled the gradual industrialization of American textile mills. By the 1860s, the community's woolens operation had progressed to the point that the next logical step was to further automate the process by adding steam power. The Civil War and a very conservative leadership hampered this advance. Eventually the progressive proponents of a modern operation prevailed, and the village constructed a large woolen

factory which commenced operation in 1866. An unfortunate fire, believed to have been set by an arsonist opposed to the Shakers' fair treatment of blacks, destroyed most of the operation on 2 September 1868.[24]

The fulling mill provided essential finishing processes for textiles for the South Union Shakers from the time of its inception, around 1815, until the operation was destroyed in the late 1860s. The services, which included fulling, shearing, pressing, and dyeing, were also marketed successfully to the outside world via word of mouth and through printed advertising. When the woolen factory burned in 1868, the Shakers did not rebuild it. Devastated by the Civil War and with a decreasing number of converts (and some would say with a decreasing zeal), the Shakers could not sustain such a large new undertaking. Also by this time, market forces had created a textile industry that could produce cloth at cheaper rates than the Shakers.

Most researchers concur that the Shakers "principally manufactured items that they needed and could not otherwise acquire" at reasonable prices. "When someone began to manufacture an item of equal quality and less expense than the Shakers manufactured, the Shakers would usually stop producing the item."[25] This theory certainly applies to woolens production; by 1868 the Shakers could not compete with the behemoth textile factories of the northeast and southeast.

Surviving Shaker textiles in museum and private collections attest to the fine craftsmanship of the Shaker sisters and brethren. Part of this mastery stems from the sect's founder, Mother Ann Lee, and her admonitions to the Shaker faithful to "Put your hands to work and your hearts to God" and to "work as if you had a thousand years to live [and] as if you were to die tomorrow." Viewing work as a form of worship inspired the Shakers to produce items of superior quality. Even items for everyday use such as textiles, which were the results of many hands and hours of tedious labor in locations such as the fulling mill, merited the fastidious attention of the Shakers who produced them.

[1] Merrimack Valley Textile Museum, *Homespun to Factory Made: Woolen Textiles in America, 1776-1886* (North Andover, Mass.: Merrimack Valley Textile Museum, 1977), p. 68. In 1810 Kentucky residents supported 33 fulling mills, Ohio 21, and Tennessee 2. *Niles Weekly Register* (1814 June 11).

[2] For more information about the textile industries (linen, silk, woolens) at South Union, see the authors' *A Thread of Evidence: Shaker Textile Industries at South Union, Kentucky* (South Union, Kentucky: Shaker Museum at South Union, 1996). To get a broader overview of Shaker textiles see Beverly Gordon's *Shaker Textile Arts* (Hanover, N.H.: University Press of New England, 1980).

[3] Many histories of the Shakers exist. The most scholarly and comprehensive is Stephen J. Stein's *The Shaker Experience in America: A History of the United Society of Believers* (New Haven, Conn., 1992). The only full-length history of the South Union Shakers is Julia Neal's *By Their Fruits: The Story of Shakerism in South Union, Kentucky* (Chapel Hill: The University Press of North Carolina Press, 1947). See also, Ms. Neal's *Kentucky Shakers* (Lexington: University Press of Kentucky, 1977).

[4] This payment was made to Richard C. Napier. The exact location of the "Iron Works" is not known; census records show a Richard C. Napier living in Casey County, Kentucky, in 1820. Luke Munsell's 1818 "Map of Kentucky," indicates an "Iron Works" on Buck Creek in Pulaski County, southeast of Casey County. On this same Map, "Shakertown" is clearly delineated in Logan County. [South Union Shaker] Record A, 26 December 1814; [South Union Shaker] Account Book, 1815-1816, 18 January 1815, II:b-55 (WR); 1820 Federal Census for Kentucky.

[5] The information about the mill's construction comes from a beautifully detailed daily journal kept by the South Union community. [South Union Shaker] Record A, 1807-1836, Manuscripts, Library Special Collections, Western Kentucky University, Bowling Green, Kentucky (hereinafter cited as WKU). Although a great deal of literature exists that extols the gender egalitarianism of the Shakers work, operating the fulling mill was generally considered a man's occupation. However, in April 1851, Chloe Teman, an African-American Shaker, was fatally injured as she worked in the fulling mill. The journalist noted that she "fell under the tappet of the fulling mill by which means she got badly injured – One of her legs was broken, besides two of her ribs – her head also bruised." Almost two weeks later, "Sister Chloe, departed this life about 12M." 1 April 1851, 17 April 1851, Record Book B, Shaker Museum at South Union, South Union, Kentucky.

[6] [South Union Shaker] Fulling Mill Broadside, 12 September 1815, Broadside no. 300, WKU.

[7] "Shaker Account Book," MSS 64, WKU. The other South Union fulling mill account books are located at the Western Reserve Historical Society, "Daybook, cloth and dye," 1811-1826 [fulling mill records account for only a portion of this daybook], vol. 49; "Account book, cloth and dye," 1815-1816, vol. 54; "Account book, cloth and dye," 1816-1818, vol. 56; "Account book, cloth and dye," 1816-1819, vol. 57; "Daybook, cloth and dye," 1820-1822, vol. 63. These account books are available on microfilm: Shaker Manuscripts, Western Reserve Historical Society, Cleveland, Ohio, II:B-49, 54, 56, 67, 63. (Hereinafter cited as WR).

[8] The database results from this study have been donated to Manuscripts and Archives, WKU.

[9] Gordon, Beverly, *The Final Steps: Traditional Methods and Contemporary Applications for Finishing Cloth by Hand* (Loveland, Colo.: Interweave Press, Inc., 1982), p. 2-3; Monte A. Calvert, "The Technology of the Woolen Cloth Finishing Industries from Ancient Times to the Present with Special Emphasis on American Developments, 1790-1840, and on the Processes of Fulling, Napping and Shearing," Typescript (Washington, D.C.: Smithsonian Institution, 1963), p. 16. Fuller's earth is a clay-like mineral, primarily aluminum silicate. Cheaper than soap, it was added to the sudsy bath to save money.

[10] For descriptions of the different fabrics see Florence M. Montgomery's *Textiles in America, 1650-1870* (New York: Norton, 1984).

[11] Gordon, *The Final Steps*, 10.

[12] Calvert, 14, 36.

[13] *Ibid*., 52.

[14] 3 August 1814, 6 January 1816, Record Book A, and 1 May 1849, Record Book B.

[15] Elijah Bemiss, *The Dyer's Companion* (New York: Dover Publications, 1973). This is an "unabridged republication of the second (1815) edition as published by Evert Duyckinck (New York).

[16] Drab is a dull brown or gray color, sometimes a light olive brown.

[17] Charles McMurry's orders from Smith County, Tennessee included a swatch; record #38 on the fulling mill database.

[18] Gordon, 17.

[19] The merchants were Amos Edwards of Russellville, A. Graham of Bowling Green, S.H. Curd of Hopkinsville, J. Tilford of Nashville, Tennessee, and the store of Faulk & Shaifer of Gallatin, Tennessee.

[20] Neatest manner refers to the best quality fabric a fuller could produce. Quality was often judged by how closely the fabric was shorn. Cloth could be shorn once, twice or even three times; the number of times depended on the fabric's ultimate use. Repeated shearing produced a finer quality cloth.

[21] Records indicate that 1,820.5 yards of the total yardage finished at the fulling mill were woven at South Union for customers, which represents about five percent of the total amount. The record books indicate that cloth was woven at the north Brick House, the Frame House, the Brick House, and at the Old Brick House.

[22] In the fulling mill database Jacob S. Baker's entries are #159 (1816), #203 (1818), and #32 (1819); his brother David's record is #119 (1820). Loving's entries are #63 (1817), #239 (1818) and #36 (1820).

[23] Great coats and surtouts were heavy, voluminous overcoats of varying styles. A surtout may have been a lighter weight and more closely cut version of the great coat. See Sarah Wilson Le Count's "'I Would Chose it to be Very Warm': The Great Coat in Early America," *The Magazine of the Midwest Open-Air Museum's Coordinating Council* 16 (Fall 1995): 10-20. Cloth used to make "negro's wear" was generally of a lesser quality. Arthur Slaughter of Logan County brought to the mill 13 yards of cloth made of woolen warp and tow filling. Tow was the fibers of the flax plant reserved for sacking and other coarse cloth. Another customer directs the fullers to full his "negro's wear" cloth in the cheapest manner. Records #175 and #217 in the fulling mill database.

[24] The story of the rise and quick demise of the Shakers' woolen industry is recounted in Donna Parker & Jonathan Jeffrey's "We Have Raffeled for the Elephant & Won!: The Wool Industry at South Union, Kentucky," *The Kentucky Review* 13 (Winter 1997): 58-74.

[25] John M. Keith, Jr., "The Economic Development of the South Union Shaker Colony, 1807-1861." (Thesis, Western Kentucky State College, 1965), 50.

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